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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/601,877	06/24/2003	Charles M. Buchanan	008111-155	1308

7590

12/03/2004

NHAT D. PHAN, ESQ.  
BURNS, DOANE, SWECKER & MATHIS, L.L.P.  
P.O. Box 1404  
Alexandria, VA 22313-1404

EXAMINER

MAIER, LEIGH C

ART UNIT

PAPER NUMBER

1623

DATE MAILED: 12/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/601,877

**Applicant(s)**

BUCHANAN ET AL.

**Examiner**

Leigh C. Maier

**Art Unit**

1623

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 16 September 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 15-22 is/are pending in the application.
- 4a) Of the above claim(s) 20-22 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 15-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 6/24/03.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

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## **DETAILED ACTION**

### ***Election/Restrictions***

Applicant's election with traverse of group II, claims 15-19, in the reply filed on September 16, 2004 is acknowledged. The traversal is on the ground that the searches for all claims would be coextensive. This is not found persuasive because the search for sulfonated C<sub>4</sub> compounds would in no way be coextensive with, for example, a method of conducting chiral chromatography comprising the use of a cyclodextrin substrate.

The requirement is still deemed proper and is therefore made FINAL.

### ***Claim Objections***

Claim 17 is objected to because of the following informalities: It appears that the compound in the claim is meant to be 3,4-dihydroxybutane-1,2-*disulfonate*. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 18 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claim recites "a mixture of sulfonated 3,4-dihydroxybutane, 1,4-dihydroxybutane and sulfonated oligomers of 3,4-epoxy-1-butene." This claim appears to be

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drawn to the mixture produced in the process of example 4. However, the claim appears to recite an unsulfonated product (1,4-dihydroxybutane), so it is not clear if Applicant intends a mixture of (1) all sulfonated products; (2) all unsulfonated products (the intermediates); or (3) a combination of sulfonated and unsulfonated products that does not appear to be otherwise described in the specification.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 19 is rejected under 35 U.S.C. 102(b) as being anticipated by REIFF et al (US 4,108,814).

REIFF discloses the lithium salt of 3,4-dihydroxy-butane sulfonic acid. See example 8.

The compound appears to meet the structural limitations of the claim and would therefore be suitable for polycondensation.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 15 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over REIFF et al (US 4,108,814).

REIFF teaches as set forth above. The reference does not exemplify the sodium salt of 3,4-dihydroxy-butane sulfonic acid. However, the reference specifically teaches the use of alkali metal salt cations of the sulfonate compounds used. See reference claim 1. Furthermore, sulfonic acid sodium salts are exemplified in other examples. See examples 1-4, 9 and 10.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to prepare the sodium salt of 3,4-dihydroxy-butane sulfonic acid to prepare a polyurethane as described in example 8 of REIFF. The reference had taught that the alkali salts are functionally equivalent. Therefore, in the absence of unexpected results, one of ordinary skill would prepare and use the sodium salt in this process with a reasonable expectation of success.

Claims 15-17 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over REIFF et al (US 4,108,814) in view of BRIGHT et al (J. Appl. Biotechnol., 1975).

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REIFF teaches as set forth above. The reference further teaches that the compound maybe prepared by the treatment of 1-butene-3,4-diol with bisulfite. See col 4, lines 45-47. The reference is silent regarding the presence of the sulfonate/sulfinate or the disulfonate.

BRIGHT teaches that the treatment of olefins with bisulfite results in concurrent formation of sulfonate/sulfinate products and disulfonate products. See section 4 and section 7.2.3.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to prepare the sodium salt of 3,4-dihydroxy-butane sulfonic acid, as discussed above. In preparing this compound, as directed in the reference, the process would be expected to result in a mixture comprising sulfonate/sulfinate products and disulfonate side-products based on the teaching of BRIGHT.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. WEIPERT (US 6,500,981) teaches the treatment of epoxybutene with sodium metabisulfite. This process results in sodium 4-hydroxy-3-sulfonate-1-butene. See example 1.

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***Examiner's hours, phone & fax numbers***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leigh Maier whose telephone number is (571) 272-0656. The examiner can normally be reached on Tuesday, Wednesday, and Friday 7:00 to 3:30 (ET).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. James O. Wilson (571) 272-0661, may be contacted. The fax number for Group 1600, Art Unit 1623 is (703) 872-9306.

Visit the U.S. PTO's site on the World Wide Web at <http://www.uspto.gov>. This site contains lots of valuable information including the latest PTO fees, downloadable forms, basic search capabilities and much more.

*Leigh C. Maier*

Leigh C. Maier  
Patent Examiner  
November 23, 2004